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(54) Title: NONSLUDGING ZINC PHOSPHATING COMPOSITION AND PROCESS

(57) Abstract

Electrolysis using a suitable electrolyte provides a completely nonsludging zinc phosphate conversion coating process that produces a high quality conversion coating in a very short time. The suitable electrolyte contains at least water, dissolved nitric acid, and dissolved zinc cations and optionally also contains m chemically distinct species of cations other than zinc and n chemically distinct species of anions other than anions derivable by ionization of phosphoric and nitric acids, each of m and n independently being zero or a positive integer. Preferably, the liquid composition contains as additive at least one selection from nitrous acid, permanganic acid, peroxy-sulfuric acid, hydrogen peroxide, chloric acid, perchloric acid, nitrobenzenesulfonic acid, hydroxylamine, starch/phosphoric acid esters, fluorine compounds, and salts of the preceding; and/or the metal substrate is subjected to cathodic electrolysis after the workpiece has been brought into contact with a weakly basic aqueous colloidal solution that contains titanium oxide, titanium hydroxide, and zinc phosphate.

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